Development of a Web-based ERP module for an Educational Institute: A case of Training & Placement (TNP) Cell

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Abstract

This paper deals with the Development of an Web based Enterprise Resource Planning (ERP) module for an Educational Institute: A case of Training & Placement (TNP) cell. An ERP system contains various modules in any educational organization in this case TNP module is being taken which is developed using JSP SERVLET technology.

Keywords: TNP, ERP, JSP SERVLET.

Introduction

An Enterprise is a group of people with a common goal, which has certain resources at its disposal to achieve that goal. In the enterprise way the entire organization is considered as a system and all the sections are its subsystem [1]. ERP that earlier used as stand-alone applications includes: Manufacturing, Supply Chain, Financials, Customer Relationship Management (CRM), Human Resources, Warehouse Management and Decision Support System [2]. The modules of the Institute ERP system are Administration, Result, HR, Result, Transport, Inventory, Examination, TNP cell, Exam, Faculty Management, Library, and Hostel [3]. The paper deals with the development of a web-based ERP module for an educational institute. The case taken is of Training and Placement Cell.

System Requirements

Software Interface/module requirement

Tools:
- IDE Eclipse (If site is not hosted/tested mode, then to run site at local host a cross platform apache is used)
- Apache Tomcat 7.0 for web server
- IBM Rational Rose (for Modeling)
- SQLyog - a MYSQL fronted.
- PC Operating system: Any.

Hardware Interface/module requirement

Processor: Pentium 4 or above @ 1.7 GHz or above.
128 MB RAM (Recommended: 128 MB RAM or greater)

Development Of Web Based Erp Module

In the design step for TNP cell module of Institute ERP design two use cases are done. There are following three actors in the system namely:

Student
TPO

USE CASE DESIGN

A use case model is a model of the system’s functionality and it is a contract between user and system. Each use case presents a single functionality when an actor interacts with the system. Following are the use cases diagram in present work.

Use Case Design for Student Actor

Use Case Design for TPO Actor

ACTIVITY DIAGRAM

Activity diagram describes the work flow behaviour of the training and placement cell of an educational institute. Number of activity diagrams are developed representing the various activities involved in TNP cell. One of the activity diagram is represented in the figure 3 below. This shows how the registration is carried out by the student.

Figure 1: Use Case for Student

Figure 2: Use Case for Student

Figure 3: Student Registration Activity

Figure 4: Approve Request Activity

The figure 4 represents the Activity Diagram for TPO Actor
SEQUENCE DIAGRAM
Sequence diagram describe the flow of logic within the system in a visual manner. In this TNP cell module number of sequence diagrams are developed. One of the developed sequence diagram is shown in the figure 5

![Sequence Diagram](image)

**Figure 5: Sequence Diagram for Registration request**

CLASS DIAGRAM
Class diagram defines a group of object in detail. It shows the state, behaviour and relationship with other object that are mandated for each object that instantiates the class. Figure 6 depicts the class diagram for student.

IMPLEMENTATION OF FRONT END
Implementation is the process of design and development of software. In the implementation process of this application JSP, SERVLET is used. MVC architecture is followed during implementation in which SERVLETS serves as a controller. HTML is used to design the graphical user interface. The Login page is common for Student as well as TPO. The figure 7 and 8 shows the front end developed for the students registration and the login form for the training and placement officer.

IMPLEMENTATION OF BACK END(MYSQL)
The application database is constructed in MYSQL. The centralized database is created named as “cell”. For this application tables created are

- **login**
  This table stores the login account details of users such as their username and password. The type column describes the type of user. For student type is 1 and for TPO it is 2.

- **placementinfo**
  This table stores the placement information of students. The placement company name will be provided for intended student.

- **regrequest**
  This table stores the registration request sent by the student to register into application. This contains an attribute status, when request is not approved the value of status is set “p” for pending; if approved the value is set to “a” for approved.

- **studentprofile**
  This table stored the particulars and academics of student. When a student registered in to application it is first unplaced hence by default the attribute placedin is set to “unplaced”. After his placement information is stored in placementinfo table; the value of attribute placedin is set to “placed”. This need not to be done manually it is automatically updated when placement information is stored.
TESTING METHODOLOGY USED

White Box Testing
White box testing considers system to be like a white box, which means that everything about the system is known to us.

Black Box Testing
Black box testing is carried out by the end users.

Unit Testing
“Focuses on individual software units, group of related units.” In this testing method test the each and every components of Project work. Test the validation of Each Control. Test the Proper Message display to user. Test the exception Handing when it occur. Test the performance time. Test the data in database to store in proper way. Test the all required of the client that are cover or not in project.

Integrated Testing
“Integration testing is done to find out even though the components were individually satisfactory, the combination is correct and consistent or not.”

TEST CASES
1) Invalid user can not login: If is incorrect username or password given, then user is not allowed to login.
2) Incomplete or Invalid user information: If user has left some fields empty or the information provided is not according to the constraints than appropriate message must be display.
3) Consistency and proper navigation must be maintained through all user interfaces.
4) Appropriate error message must be displayed according to user action.
5) Data should be stored and retrieved correctly through database.
6) The system should be tested in client’s environment.

CONCLUSION
The prototype Implementation of an web based ERP module is developed for TNP cell activity of an institute. The design module of the developed system successfully accesses the ERP module and TNP data. The activity of TNP cell is modulated into the web based application which is design and implemented and tested accordingly. The web based module is capable of sending Emails and SMS. The system developed can be applied to any Educational Institute. The system is powerful and user friendly as it gives wider flexibility of using and updating knowledge.
Acknowledgements
The author thanks to the institute for providing the necessary infrastructure.

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